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April 2, 1960

VOLUME 14 NUMBER 15

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



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Algae and the Bank

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MEDICINE

Animal Grafts Succeed

BODY ORGANS and tissues have been successfully transplanted from one unrelated animal to another, it has been reported.

Dr. P. S. Russell of the Massachusetts General Hospital, Boston, has grafted hormone-producing glands, skin and other tissues between non-related mice strains and had the grafts persist and function for long periods of time.

This is significant because animals and humans are immune to tissues from an outside source. Except in identical twins, tissue cannot be transplanted from one individual to another. Antibodies form against the transplant and destroy it.

In his American Cancer Society-supported experiments, Dr. Russell employed techniques developed by Dr. P. B. Medawar of the University of London, who had previously found that if he injected a newborn animal with spleen cells from another adult animal, the recipient from then on could not form antibodies against any subsequent graft from the donor.

Dr. Russell "primed" mice for future transplants by injecting them within a day after their birth with spleen cells from future donors. The "tolerant" mice had their adrenal glands removed and were

then grafted with the adrenals of the animals that months earlier had supplied the immunity-destroying spleen cells. The new hosts were found to remain in good health. Had the grafts not taken, the animals would have died of shock, fatigue and hunger.

Dr. Russell also grafted skin successfully to tolerant animals and found that he could end an animal's tolerance to grafts by injecting the animals with antibodies against the original spleen cells with which it was injected.

At this time, he said, the findings appear to have only theoretical implications for humans. It is conceivable, for instance, that a newborn baby might be injected with spleen cells from its father or mother. That baby could then be grafted with an organ or tissue from the donor parent.

This could be desirable for children who might someday need a graft because of burns or organ disease. Because of the impossibility of foreseeing at birth the need of transplants later in life, however, it is unlikely that spleen transplants will be given newborn babies in the near future.

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ENGINEERING

Muscle Signals Detected

MUSCLES broadcast not only relatively powerful signals, but also very weak, high-frequency electrical signals, two physicians reported.

The new range of weak signals has been detected with a recently perfected ultra-quiet amplifier. This new technique may eventually explain often questioned natural phenomena such as telepathy and extra-sensory perception, and may even add further knowledge to the well-established phenomenon of hypnosis, they stated.

For now the doctors' findings may aid in diagnosing muscular diseases. The physicians said abnormalities in muscle structure affect the frequency pattern of the voltages generated by the muscle.

The work was reported by Drs. W. K. Volkers of Cohu Electronics and W. Candib of St. Claire Hospital, both of Schenectady, N.Y., to the Institute of Radio Engineers meeting in New York.

The physicians used a new ultra-low-noise transistor amplifier to pick up muscle signals up to 50,000 cycles per second in frequency. They found such ailments as muscle thickening, retention of water and diminished blood supply each had its own frequency pattern.

More powerful muscle signals of a few hundred cycles per second are already commonly used for diagnosis of the heart (with a cardiograph), brain (with an encephalograph) and muscles (with a myograph).

Because of such marriages of electronics

and medicine, Dr. Hans H. Zinsser of the Columbia University College of Physicians and Surgeons told the convention that a new academic degree should be provided for a new profession: medical engineering.

Satellite Computer

MORE EXPERIMENTS may be packed into future American satellites because of bits of materials, called semi-conductors, having an electrical conductivity neither as good as metal nor as bad as an insulator.

Several of these new cousins of transistors were unveiled at a Coliseum exhibit at the meeting. The exhibits showed:

1. For satellites, electronic computers the size of a pack of cigarettes will be produced from a stack of button-sized ceramic circles and metal disks. They may let engineers pack six times more circuitry in a given satellite. Shown by the General Electric Company, the computer circuitry is radiation-resistant.

2. A five-watt electric generator fueled by a pellet of strontium-90 was shown by the Martin Company. By turning heat into electricity, it could power an automatic weather station for two years without recharging.

3. What is claimed to be the world's smallest gearhead was shown by the Bowman Instrument Corp. Half an inch in diameter, it converts guidance signals into small movements to keep a missile on course.

4. A new scanner by the Martin Company sharpens infrared "eyes" for satellites and anti-missile guidance. It "sees" objects in total darkness by detecting heat the objects generate. It will even see another satellite.

Ignore Weather Research

THE UNITED STATES is ignoring weather research because of "apathy," asserts Adm. Luis de Florez, a former assistant chief of Naval Research. He said he thinks weather research is of greater immediate importance than landing a man on the moon.

In a speech prepared for the meeting Adm. de Florez said that "practically no effort is being made to determine whether storms can be diverted or dissipated or whether the energy developed in such atmospheric disturbances can be used as a weapon for us or against us."

America's air defenses depend on the weather, the admiral said, but the importance of weather research is not realized nor is the urgency.

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ELECTRONICS

Stereo Broadcasts in FM Due by Next Christmas

FIVE TECHNICAL ways to broadcast high fidelity music in stereophonic sound using only one FM radio channel have been proposed to the Federal Communications Commission. A final decision is expected by the end of the year.

This means that next Christmas you may be able to buy a new radio fully equipped to receive stereo sound using two loudspeakers on one radio.

If you already have a radio system equipped to take a stereo adapter, the new rulings will mean that manufacturers will soon be putting the long-awaited adapters on the market.

The proposed systems, submitted to the FCC with comments by a National Stereo Committee of the Electronic Industries Association, will follow generally along this line:

The stereo FM station will broadcast over its assigned frequency, but the assigned frequency will carry two superimposed sub-carriers. The standard frequency will be used to transmit one of the stereo sound channels, and one sub-carrier will transmit the second stereo channel. These two channels will be unscrambled electronically by the radio and fed to the proper loudspeakers.

The remaining sub-carrier can be used to help support the station financially through broadcasts to stores, called "storecasting," which can be received only on special radio receivers.

The FCC is now studying the proposals and hopes to issue within a month its proposed rules. This probably will be followed by hearings, and finally a decision around December.

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GENERAL SCIENCE

Space Race Held Up

National Research Council blames lag in basic materials research for snag in national security program. Council urges government support in search for new materials.

IMPORTANT national security programs are being held up by a lag in the development of new metals, ceramics and plastics, a committee of the National Academy of Sciences-National Research Council, Washington, D.C., has charged.

After a year's study of the materials research program pursued by Government, universities and industry, the committee filed its report. It listed the worst problems and proposed potential solutions.

Pointing a finger at inadequacies all along the line, the committee stated that nuclear propulsion systems, space vehicles, better missiles, rocket motors, naval vessels and electronic devices have all been designed and put down on paper. But construction can not proceed because available materials are not tough enough. They will not stand up under the severe pressures,

heats, colds, corrosion, stress and radiation exposure conditions.

Basic materials research is not being done by enough people; consequently, the necessary work is not being done fast enough. There is a considerable time lag in reporting new finds and an even bigger delay in getting a new material out of the experimental laboratory and into large-scale production and use, the committee declares.

In the armed forces alone, the Air Force has four major groups working on materials problems; the Army has six, and the Navy seven. There are other groups in Government, private industry and universities, but efforts are not fully coordinated. Research may overlap, communication is not always good and facilities are not used to full advantage.

Each separate group is plagued by ex-

pense. Pilot plants, or testing rooms which must be capable of taking a terrific beating, are so expensive that very few have been built. Some of the essential metals, such as tellurium, rhenium and tantalum, are difficult to get, and costly.

"There are no magic administrative or technical solutions to the materials problem," the committee noted. "What is needed is significant strengthening at every level of activity."

Even so, the committee has offered constructive recommendations for pulling security programs out of the doldrums.

1. The Government should give high priority to materials problems and to the training of capable scientists and engineers. Programs in the various agencies should be strengthened and national security aspect of materials research should be recognized as an "end-object" in its own right.

2. Government agencies should reorganize for greater centralization of responsibility and more emphasis should be placed on materials research.

3. The Government should lead the way in creating more interest in materials problems by modifying contract and patent policies for private companies. Testing facilities owned by Government, private industry and universities should be pooled and used to the best advantage.

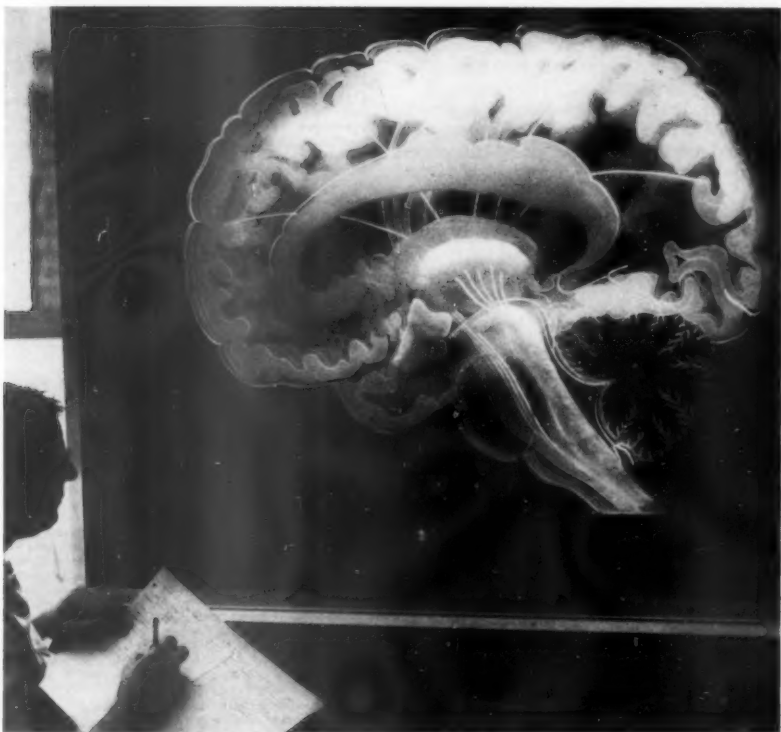
4. Long range supply and demand for metals and materials should be reviewed once a year by the Office of Civil and Defense Mobilization. The Government should spearhead the search for new ore deposits and should sponsor research on better ways of getting the metals from the ore.

5. The Government should stockpile all needed materials.

6. All groups concerned should make certain that technical information is passed on to the others as fast as possible. It must be accurate, concise and new, rather than "just a rehash of old information."

7. The Government should support the universities with funds and facilities for training scientists and engineers and for doing more basic research.

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ANIMATED BRAIN—A giant brain, constructed of 20 layers of sandwiched plastic, tests the effects of tranquilizing drugs. The brain was developed by Dr. Harold E. Himwich, of Galesburg State Research Hospital, Ill., and built by George Krajian (seen at left) of the American Museum of Natural History, New York, with a grant from Wallace Laboratories. Its lighting arrangements are controlled by an electronic computer.

MEDICINE

"Telemeter" Records Animal Temperatures

A TEMPERATURE recording device that can be implanted in a laboratory animal has been developed and promises to give medical researchers more accurate information on fever, man's natural defense against germs and viruses. The device is about the size of a man's watch and can be left in the animal throughout its life. It needs no batteries and eliminates handling the animals to take readings. Described to the Biophysical Society in Philadelphia by John H. Busser of Franklin Institute Laboratories, the "temperature telemeter" works when the animal in which it is implanted is surrounded by a low frequency power field—equivalent to placing the animal inside a transformer. From this power field, the device gets energy to send back its findings to a receiver.

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ASTRONOMY

Twinkling Stars Studied

ASTRONOMERS at the Mt. Palomar Observatory, Pasadena, Calif., have completed studies of twinkling stars which will help measure astronomical distances far more accurately than ever before.

For more than 40 years astronomers have based their measurements on the twinklers, pulsating stars known as cepheid variables. But the calibrations were not as accurate.

These stars have two unique habits that make it possible to use them as distance indicators. They dim and brighten in a rhythmic cycle, called a period, and the length of their blink period and their brightness are related. In other words, the longer the period, the brighter the star. Twinklers with half-day periods are 100 times brighter than the sun and those with 40-day blinks are 6,000 times brighter than the sun.

This means that if two cepheids of the same period are compared and one of them appears to be brighter than the other, the difference in brightness will be due entirely to the fact that one is farther away than the other. If one appears to be one-fourth as bright as the other, it means that it is twice as far away because brightness varies inversely with the square of the distance. If in addition the actual distance of one of them is known, the distance of the other can easily be calculated.

Astronomers found that a few cepheids twinkled irregularly and that others did not conform exactly to the period-luminosity relationship. Small differences in color were discovered in cepheids having the same period.

A group of astronomers from Mt. Wilson and Palomar Observatories found that some of the cepheids were redder than

others, due to thin dust clouds somewhere between the viewing telescope and the star itself. They also discovered that over a period of many years, a pulsating star loses some of its blueness and becomes yellower and cools off about 1,000 degrees Fahrenheit.

The studies indicate that the larger stars are more reliable as distance indicators. By correcting for the color differences, astronomers can now calculate distances as far as the telescope can see.

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CHEMISTRY

Silicon-Boron Compound Resists Heat, Oxidation

LARGE QUANTITIES of the little known compound tetraboron silicide, B_4Si , can now be prepared for the first time.

Dr. Ervin Colton of the Allis-Chalmers Manufacturing Company, Milwaukee, Wis., reports in the Journal of the American Chemical Society, 82:1002, 1960, that this compound in reasonably pure form is obtained when a mixture of the elements boron and silicon is heated in an inert atmosphere at between 2,200 degrees and 2,500 degrees Fahrenheit.

Objects made from the powdered compound have been shown to be highly resistant to oxidation at 2,500 degrees Fahrenheit due to a protective film that forms on exposure to the air at high temperatures. It also showed excellent thermal shock resistance in that no cracks appeared when the objects were cooled rapidly from that high temperature to room temperatures several times.

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MEDICINE

Nephritis From Tonsillitis

EITHER TONSILLITIS or impetigo can trigger an inflammatory disease of the kidneys in children, a Memphis pediatrician reported.

The disease, acute nephritis, is caused by sensitization to products certain types of streptococci produce, Dr. James G. Hughes told family doctors attending the American Academy of General Practice meeting in Philadelphia.

The most common symptoms are blood in the urine and puffy swelling of the face and other parts of the body. The child has a high fever, poor appetite and usually a higher blood pressure than normal.

The University of Tennessee professor said three major complications can result. The central nervous system can be affected, making the child drowsy, lethargic, unconscious or convulsive. There can also be a temporary disturbance in vision, he said.

Other possible disturbances include heart trouble, with shortness of breath, coughing, swelling of the liver and lower parts of the body, and uremia, the complete cessation of kidney functions and failure to form urine to remove body waste products.

In treating the child with acute nephritis, the physician must remember that the original strep infection may still be present. If a throat culture shows streptococci, Dr. Hughes advised giving the child a shot of penicillin to kill the organisms and to keep the infection from spreading to other persons.

Until the acute phase of nephritis has passed, the child should be kept in bed. There is usually no need to restrict the child's diet or fluid intake, he said. However, if the child is not forming enough urine, it is important not to overload him with fluids and to avoid high intakes of nitrogenous and potassium-containing foods that would increase the biochemical disturbances.

Ills Show in Check-Ups

REGULAR PHYSICAL check-ups reveal some previously unrecognized disease in one-fourth to one-third of supposedly healthy adults, a physician reported.

In about half these cases the patient has not experienced any symptoms of the disease in question, Dr. Norbert J. Roberts, associate medical director of Standard Oil of New Jersey, reported at the meeting.

Fifteen to 20% of patients examined periodically, he added, need medical observation or treatment for disease or defects that were previously known to exist.

Chemical Poisoning Toll

MORE THAN 400 American children under five years of age die each year of chemical poisoning, Dr. Harold Jacobziner of the New York Department of Health told the meeting. Last year, he said, more New York City children under five died

from accidental poisonings than from diphtheria, polio, and streptococcal infections such as rheumatic fever, scarlet fever combined. Prevention of accidental poisonings is possible through education at all levels of the profession and public, Dr. Jacobziner said.

Boil Baby's Bottles?

BABY BOTTLES need not always be boiled, a pediatrician reported.

To back up this statement, Dr. Carl C. Fischer, head of the department of pediatrics at Hahnemann Medical College, Philadelphia, explained his simple and safe method of feeding infants which he devised to relieve young mothers of some of their work load.

The method consists of mixing evaporated milk and ordinary hot tap water. The hot water saves time by eliminating the need to reheat the bottle before feeding, he pointed out to colleagues attending the meeting.

Results of a study revealed no statistical difference in weight gained between those babies fed formulas by this method and those fed sterilized formulas.

Furthermore, there was no evidence of gastrointestinal infection in either group, he pointed out.

Bacteriological studies showed that single feedings prepared from sterile milk and hot tap water, immediately refrigerated, remained sterile for an indefinite period (longer than 24 hours).



INFRARED SCANNER—This 50-pound gyroscopic far infrared scanner, made by the Martin Company's Baltimore Division, will be used for missile guidance or interplanetary navigation. Project engineer Irving E. Distelhorst's face is reflected in the scanner's primary mirror.

In contrast, those similarly prepared with homogenized grade A milk showed an increased bacterial count.

Dr. Fischer did emphasize that this method should be confined to single feedings and all unused portions of each bottle should be discarded immediately. Also, mothers must obey strict sanitary rules and follow instructions carefully, he reminded.

Further comments on infants' diets also came from colleague Dr. Walter W. Sackett Jr. of Miami, Fla., who stated that a six-month-old child often enjoys, and is not harmed by, an occasional cup of coffee. Driving home the point that infants can eat solids, he cited his success with two- and three-day-olds who ate and enjoyed cereal.

He also recommended strained vegetables for the 10-day-old and meat for those two weeks old.

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ROCKETS AND MISSILES

Vanguard Rises, Sinks A Mile Every 850 Days

A TEAM of scientists have discovered that solar radiation pressure accounts for the discrepancy between calculated and observed heights of Vanguard I when it is closest to earth.

Dr. Peter Musen, Robert W. Bryant and Ann Baile, all of the theoretical division of the Goddard Space Flight Center of the National Aeronautics and Space Administration, reported to Harvard College Observatory, Cambridge, Mass., that the height of Vanguard I at its perigee, or point closest to earth, varies over a period of 850 days due to the pressure exerted on the satellite by rays from the sun.

Dr. Musen said that over this period of time the satellite rises and sinks approximately a mile at the point closest to earth. He began investigating the idea of solar radiation pressure at the suggestion of Drs. Robert Jastrow and John A. O'Keefe, both of NASA, when disturbances caused by the earth's irregular shape and the sun and moon's gravitational forces did not account for this variation.

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BACTERIOLOGY

Roaches May Spread Food Poisoning Germs

COCKROACHES may be spreading food food poisoning germs, a study at Kansas State University indicates. Dr. T. H. Lord, Kansas State bacteriologist, captured 100 groups of brown-banded roaches and found that about one-fourth contained the bacterium *staphylococcus aureus*, which is responsible for food poisoning. Because 25% of the roaches contain this germ, Dr. Lord thinks it reasonable to assume that food poisoning germs may be spread to uncontaminated food, or to other places, by these insects. The brown-banded cockroach is difficult to control, he said, because it will travel over a wider area in search of food than the German cockroach.

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ANTHROPOLOGY

African Wall Painting Dying

THE DYING ART of house-wall fresco painting among African peoples may die out entirely without leaving any examples for posterity unless museums interested in African art take steps in time.

The paintings are of two types: geometric paintings done by women on their houses, and figure paintings done by men on the temples and chiefs' houses. Dr. Herta Haselberger, of the School of Technology, History of Art Institute, Vienna, reports in a new journal, *Current Anthropology*, 1:79, 1960.

If individual works are not secured by museums, the geometric paintings will disappear within the next five to ten years. This art is practiced today by only a few old women artists, and the decorated houses can only stand about ten years, Dr. Haselberger said.

The geometric paintings are found in West Africa. Similar paintings are done in Southern Nigeria, the Congo Basin and South Africa. These paintings contain various geometric designs, including circles, triangles and checked patterns. They resemble paintings of the late stone and early metal ages of the Eastern Mediterranean.

The figure paintings done by men have a common trait with prehistoric paintings in Europe and Africa. They portray figures floating freely in space, without consideration for perspective or background detail. Figure painting is found in the Northern Niger area, the central Guinea Coast, the Congo Basin and East Africa.

In areas where the outside world has had no influence, the colors in the paintings are mainly white, red and black. White is for spirits and for the dead. Red is the color of rejoicing and pleasing to the gods. Black is for sacrifices to evil spirits. Blue and green are said to be due to Egyptian influence when they occur.

The painting is done on a "canvas" made of ant hills and cow dung. The white paint is made from kaolin earth, chalk, a tropical plant and mud. Red paint is derived from red earths, red lice and the bark of red trees. Black paint comes from black earth, graphite, soot, charcoal and carbonized plants. Brushes are made from leaves or berries, but some of the painters simply use their fingers.

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CONSERVATION

Mountain Gorillas Periled

SACRED COWS may bring about the destruction of the 350 mountain gorillas remaining in the Virunga volcano area of the Belgian Congo's Albert National Park if conservationists do not intervene.

The refuge lies partly in the Belgian Congo and partly in bordering Ruanda and Urundi, United Nations Trustships. It is from Ruanda that the threat to the future safety of the Albert Park mountain gorillas emanates.

In Ruanda, worship of the cow, introduced by the Watusi, is still practiced. Because the social standing of cow owners depends on the number of heads they own, no cows are killed and forage area is utilized wastefully to keep them alive.

Useless grazing has led to total depletion of forest vegetation and to erosion in a country where there are few wooded districts. One of these covers the slopes of the Virunga volcanoes.

An increase in the cattle population and demand for more grazing ground have caused shepherds to push herds deeper into Albert Park, damaging the natural habitat of the gorilla.

At present, habitat destruction by cattle is mainly confined to sectors at altitudes below 3,000 feet. An extension of this destruction and an invasion into the Hagenia forest, where the most abundant food supply for the vegetarian gorillas is found, could well prove fatal to the perpetuation of the wild life of the Virunga area.

For several years, the Institute of the

National Parks of the Belgian Congo, headed by Dr. Victor van Straelen, has vainly sought to stop this destruction of habitat, but the Institute no longer enjoys "the support of the administrative and judicial authorities."

He attributes the passive attitude of the authorities to political considerations in anticipation of the Belgian Congo's independence, scheduled for June 30.

Dr. van Straelen is appealing to international opinion to protest the useless destruction of gorilla habitat which, he says, can only result in the gorillas being wiped out. A possible solution, he thinks, is to put such unique sanctuaries as Albert Park under international control.

The mountain gorilla is one of two subspecies of the gorilla genus, the other being the lowland gorilla. According to best possible estimates, there are something over 3,000 mountain gorillas in existence in Africa.

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ROCKETS AND MISSILES

Artificial Moon to Probe Upper Part of Ionosphere

A GOVERNMENT LAB and a private firm will work together to develop satellite systems for probing the upper part of the ionosphere, an area that begins 25 miles above the earth. The ionosphere bounces back to earth many radio waves, permitting long-distance radio communications.

But the satellite will orbit above the ionosphere and send radio waves down to it, instead of up. By sounding the upper layer of the ionosphere in this manner, the satellite should determine the density of electrically charged particles there.

Because of the ionosphere's importance in radio communications, the National Aeronautics and Space Administration has contracted with the National Bureau of Standards' Central Radio Propagation laboratory in Boulder, Colo., to plan and design the experiment for the satellite.

The private Airborne Instruments Laboratory on Long Island, N.Y., has been awarded a contract for the design, development and manufacture of the satellite payload and ground controls.

It is planned that the system, when completed, will be tested at Wallops Island, Va., and eventually launched from the Pacific Missile Range in California.

Plans call for the payload to send data for from six to 12 months. The Bureau of Standards has announced no target launch date yet.

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GEOLOGY

World Geology Covered By Array of Journals

WHETHER NEW discoveries about the crust of the earth are published in Russian, Chinese, Japanese, English or other languages, geologists have a chance to learn about them from an array of journals.

Latest is a cover-to-cover English translation of the Russian publication that reports Soviet research. This is issued by the American Geological Institute as the "Doklady of the Academy of Sciences of the U.S.S.R., Earth Science Sections." It is a running mate to another similar complete translation of the Soviet original research journal, issued as the *Izvestiya of the Academy of Sciences of the U.S.S.R.*

Earth sciences information out of the more difficult languages including Russian, Chinese and Japanese, is published monthly in the form of translations, reviews and symposia in *International Geology Review*. Another publication devoted to the geological literature of North America in abstract is *GeoScience Abstracts*. A feature of this publication is reporting on new geological maps and also abstracting available Russian translations.

The American Geological Institute consists of member organizations, including American Association of Petroleum Geologists, American Geophysical Union, American Institute of Mining Metallurgical and Petroleum Engineers, Association of American State Geologists, Geochemical Society, Geological Society of America, Mineralogical Society of America, National Association of Geology Teachers, Paleontological Society, Seismological Society of America, Society of Economic Geologists, Society of Economic Paleontologists and Mineralogists, Society of Exploration Geophysicists and Society of Vertebrate Paleontology.

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CHEMISTRY

Make Heavy Elements

IN ONE OF the giant atomic reactors at Savannah River, S. C., about a pint, 12 kilograms, of plutonium, fission bomb element, is being bombarded with neutrons.

Some years hence chemists will extract the world's largest quantity of the extremely rare man-made chemical element californium, number 98, a matter of only a milligram, about one thirty-thousandth of an ounce.

This will be a major step toward understanding and possibly using the heaviest known elements that can be converted in a step by step process of successive transmutation into heavier elements.

This promises also to lead to the creation of still undiscovered element 103 and still heavier elements.

Dr. Glenn T. Seaborg, Nobel laureate, discoverer of many of the transuranium elements of the atomic age, who is now chancellor of the University of California, Berkeley, described the new long-range national program to produce research quantities of synthetic elements 97, 98 and 99 in receiving the Dickinson College 1960 Priestly Memorial Award.

Dr. Seaborg proposed at the same time that the new program be expanded into an international effort at the U. N.'s International Atomic Energy Agency in Vienna, with scientists from other nations, including Russia, to participate.

About 100 grams, three ounces, of curium, element 96, will be produced by 1963 in the first step, along with other heavy elements.

By that time, the University of California is expected to have a high flux neutron reactor, part of the current proposed program

of the Atomic Energy Commission. The curium, much more than ever produced before, will be subjected to the extremely high concentration of neutrons that will be created in the new reactor. At the end of two or three more years further transmutations will have occurred, and there will be extracted about a milligram of californium.

A milligram of californium will be many times more than scientists have ever been able to assemble. It will be a treasure worth millions of dollars and have intangible value beyond price. Part of it will be used, for example, as a target material in atom-smashers like the Berkeley HILAC, in which Dr. Albert Ghiorso, of the Lawrence Radiation Laboratory, would attempt to create element 103.

Out of the discovery of such new elements and chemical and other studies of the properties of the extremely heavy nuclei will come refinements of knowledge of the heavy atomic nuclei the value of which cannot be calculated.

In proposing that the program be made international, Dr. Seaborg said: "The program meets all the criteria for international development. There is nothing more basic or more international than the chemical elements. They are the elementary stuff of the universe. These heavy ones have no military value. Making the heavy ones is extremely expensive. If we can include scientists from other countries in the program, and provide them with some of the materials we will make a valuable contribution to the expansion of human knowledge and international understanding."

Science News Letter, April 2, 1960

ANTHROPOLOGY

Cold Indians Keep Warm

INDIANS living at the tip of South America have higher basal metabolism and body temperatures than whites.

Nine physiologists and anthropologists, led by Dr. H. T. Hammel of the University of Pennsylvania School of Medicine, Philadelphia, tested responses to cold exposure of the Alacaluf Indians on Wellington Island off southern Chile.

In tests, adult male Indians slept in single-layer blanket bags in unheated tents at temperatures between 32 degrees and 41 degrees Fahrenheit.

While the subjects slept, oxygen consumption, carbon dioxide production and body temperatures were measured to obtain the metabolic rate and to show how their skin conducts heat. Their metabolic rate is generally high, and it increased further when shivering occurred.

The Alacaluf Indians were observed by Darwin who reported in 1832 that they wore few clothes of skin and often were seen in their daily activities without clothes. He writes that a "woman, who was suckling a recently born child, came one day along

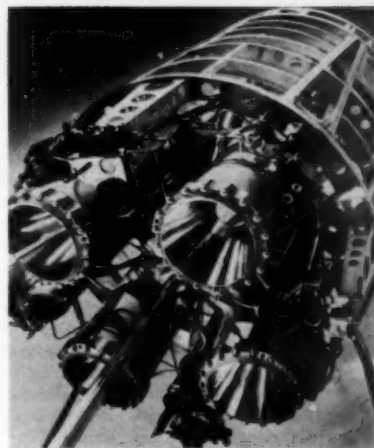
side the vessel . . . whilst the sleet fell and thawed on her naked bosom, and on the skin of her naked child."

However, Dr. Hammel's report in the second issue of a new journal, *Current Anthropology*, 1:146, 1960, holds that these Indians are not exposed to cold for long periods.

They live in huts made of saplings and covered with seal or other skin. Although the wind blows freely through the huts, a fire is maintained in the center of the hut, and the Indians sleep between skins with their dogs gathered around them for added warmth.

During the day, the Alacalufs usually expose only their arms and legs to the cold. Their extremities are rarely covered although today the men will sometimes wear cast-off shoes obtained from sailors. They generally search for food and fuel with a canoe, but the women and children often wade in the cold waters of the shore to find mussels, clams and sea urchins for food.

Science News Letter, April 2, 1960



BLACK KNIGHT ENGINE—A Bristol Siddeley Gamma Mk 201 rocket engine powers the British re-entry vehicle, the Black Knight. It burns hydrogen peroxide and kerosene and weighs 700 pounds. It has been successfully tested at altitudes of 250-500 miles in Woomera, Australia.

TECHNOLOGY

Diamonds May Prove Doctors' Best Friend

DIAMONDS, a girl's best friend already, will find new friends in industry and medicine if a high-voltage electron accelerator pays off for the Diamond Research Laboratory in Johannesburg, South Africa. Researchers will study diamonds' potential uses in supersensitive thermometers, as transistors and as tiny probes for tracing radioactive matter.

Some diamonds are semi-conductors with electrical resistances that vary with slight temperature changes. Bombardment with electrons may change some diamond characteristics.

Science News Letter, April 2, 1960

FOOD TECHNOLOGY

Algae Bank Gets Funds For Next Five Years

See Front Cover

AN ALGAE "BANK" of more than 800 strains, studied as a possible food to meet the threat of over-population, will be supported by a grant of \$34,600 for the next five years from the National Science Foundation.

Prof. Richard C. Starr, Indiana University botanist, is seen with part of the bank on the cover of this week's *SCIENCE NEWS LETTER*.

The algae are grown in glass tubes in a constant temperature under continuous fluorescent lighting. They are studied as a food and used in genetics research. They may possibly be grown on future space flights as food for space travelers.

Science News Letter, April 2, 1960

PUBLIC HEALTH

Hothouse Oats Fed Cows Reduce Radioactivity

COWS WHO EAT hothouse crops grown in nutrient chemical solutions, rather than soil, produce milk with reduced radioactive fallout content, research indicates.

Dr. Robert H. Fetner and Randall W. Carter of the Georgia Institute of Technology, Atlanta, Ga., studied two groups of cattle to see if modified feeding procedures could reduce the content of potassium-40 and cesium-137 (isotopes occurring in radioactive fallout) found in milk.

They grew oats in "incubators" as big as a house and fed 20 pounds of it each day to 10 cows. Then other cows were allowed to graze in an open field. Both groups were fed their usual hay and grain diet.

Over a seven-week period, milk from the incubator-oats group averaged 38% lower cesium-137 content than that from the grazing group. Findings for potassium-40 were "insignificant or inconsistent."

The Georgia Tech scientists, reporting in *Nature*, 185:858, 1960, said that the difference was even more significant in view of the fact that the substituted incubator feed "comprises only a part of the total diet."

Other research groups are studying large-scale use of a filtering technique which is said to remove up to 94% of the strontium-90 from skimmed milk.

Maximum permissible concentration of radioactive elements found in milk have been set by the National Committee on Radiation Protection and Measurement. Samples taken from time to time show that levels so far have been below these limits.

Science News Letter, April 2, 1960

MEDICINE

Aminotriazole Promising In Antithyroid Treatment

AMINOTRIAZOLE, the weed killer that sparked the "cranberry crisis" last November, shows promise of becoming a useful medicine for humans, it has been reported from Chicago.

Currently, Dr. E. B. Astwood, professor of medicine at Tufts Medical School, Boston, is receiving results from experiments that lead him to speculate that the weed killer can help victims of overactive thyroid. In a letter to the editor of the *Journal of the American Medical Association*, 172:1319, 1960, he pointed out that he and his associates had been looking for an antithyroid compound. They wanted one that would have a longer lasting action than those now used to treat goiter such as thiouracil or mercaptoimidazole. They suspected that aminotriazole might be such a compound.

It was the discovery of traces of this compound in certain cranberry crops that prompted the Government to issue a warning to consumers last fall. Aminotriazole was at that time labeled a cancer-causing agent.

It is misleading to refer to an antithyroid compound such as aminotriazole as a carcin-

ogen because this term implies such locally acting irritants as coal tars, which when painted on the skin of animals, induces cancer, he explained. Furthermore, the so-called carcinogenic action of the weed killer and related compounds in rats results entirely from the antithyroid effect, he added.

Several antithyroid drugs have been widely used in the treatment of hyperthyroidism in the past 17 years, and no instance of cancer has been associated with their use, Dr. Astwood said. The doses used for this purpose were much larger than the quantity of aminotriazole that would derive from the most highly contaminated cranberries.

It seems inconceivable that an antithyroid compound, no matter how potent and however prevalent in food, could ever lead to the development of the sort of thyroid nodules that were elicited in rats, he said.

Science News Letter, April 2, 1960

MEDICINE

Level of Cholesterol Differs Among Monks

TRAPPIST MONKS, who are strict vegetarians, have less cholesterol in their blood than Benedictine monks, who do eat meat, a study reveals.

A study of the blood-cholesterol levels of members of the Trappist and Benedictine monastic orders shows that, on the average, Trappists derive only 26% of their calories from fat, while Benedictines obtained 45% of their calories from fat.

Animal fats, such as those in eggs, cream and butter, account for only 43% of the fat in the Trappist diet. The same foods, plus meats, account for 75% of fats in the Benedictine diet.

The study was made by a group of researchers from the Georgia Department of Public Health and was reported from Philadelphia in the journal *Annals of Internal Medicine*, 52:368, 1960, publication of the American College of Physicians.

The study also revealed a difference in the percentage of total calories obtained from carbohydrates. Trappists obtained 64% of their calories from carbohydrates, whereas Benedictines received only 42%. Proteins were found to comprise 10% of the Trappist diet and 13% of the Benedictine.

The study aims at discovering whether one of the two groups develops atherosclerosis at a faster rate than the other or suffers more from coronary disease.

The stability of monastic life and the similarities between the two communities, the researchers reported, make these two groups suitable subjects for comparison in such a long-range study. But there are also differences between the two.

Trappists are withdrawn from the world, devoted to contemplation, prayer and physical labor, and neither smoke nor drink. Benedictines are teachers and preachers and are not prohibited from smoking or drinking.

The scientists involved in the study are Drs. J. Gordon Barrow, Carroll B. Quinlan and Gerald R. Cooper, and Virginia S. Whitner and Mary H. R. Goodloe, all of Atlanta.

Science News Letter, April 2, 1960

IN SCIENCE

SEROLOGY

Blood Type May Tell Racial Origin of People

THE BLOOD TYPE of a person living today might give a clue to his racial origin if compared with blood types of the ancient dead.

Paleoserology has long sought to determine the blood types of ancient dead people in an attempt to establish whether the different races have predominant blood type traits.

Blood stains of mummified tissue and bones have been studied to determine blood types of people who lived in past ages. This blood typing is based on the standard test and has been made possible by the discovery that the blood-group substance is not only in the blood but distributed throughout the body.

Anthropologists trained in these blood typing techniques are now working in two laboratories in Britain and two in the United States. They hope to relate their information to the distribution of blood types in modern peoples.

It has been found that type O blood is predominant among the people now living on the American continent. This is more generally true in South America. However, the incidence of type A increases with the increase in latitude in North America. The scientists offer no explanation for this.

The work was reported in *Science*, 131:699, 1960, by Dr. Madeleine Smith of British Museum, London.

Science News Letter, April 2, 1960

ARCHAEOLOGY

Indians Lead Students To Mayan Paintings

FRIENDLY Mexican Indians showed two U.S. students how to find the ruins of a Mayan temple. This is the first ruin discovered in 15 years with painted religious symbols intact.

The find is outstanding as the paintings are in good condition although painted on the outside of the walls where they would ordinarily be exposed to water erosion from torrential rainfalls that in this region average up to 12 feet a year. The parts of the paintings found intact were sheltered by an overhang.

John P. Milton, an archaeology student of the University of Michigan, and Gene Dursin, a student of the University of Oregon, made the discovery in the jungle southwest of Lake Lacanja in the state of Chiapas in southern Mexico.

The Lacandon Indians, called the last of the Mayas, led the two students to the ruins which they called Yatoch Ku, the house of God. Five different ruins were found, including three pyramids.

Science News Letter, April 2, 1960

ICE FIELDS

MEDICINE

Increase in Carbon Dioxide Intoxication

CARBON DIOXIDE intoxication, often unrecognized but serious nevertheless, may be on the increase.

This is suggested by Dr. Ronald J. O'Reilly, radiologist at the University of California Medical Center, Los Angeles, whose recent review of the disorder appears in *Diseases of the Chest*, 37:185, 1960.

Carbon dioxide intoxication may occur when lungs, weakened by chronic diseases, such as emphysema, are unable to get rid of carbon dioxide properly.

As a result the gas builds up to abnormally high levels in the blood, an imbalance which in turn affects the control of breathing. Initially one may overbreathe but the end point is underbreathing.

Symptoms of the disorder are drowsiness or actual coma and a blue color from lack of oxygen in the blood.

A standard treatment for patients with an apparent lack of oxygen is to place them in an oxygen tent. But in patients suffering from carbon dioxide intoxication this may initiate a vicious circle. As more oxygen comes in, breathing may be depressed and more carbon dioxide "piles up" in a system which cannot properly rid itself of the gas. Sudden death may follow.

Carbon dioxide levels in the blood may be determined by relatively simple tests, Dr. O'Reilly points out. If there is carbon dioxide intoxication, the patient may be placed in an iron lung, which will do the breathing for him. In this manner, oxygen can be administered moderately without risk to the weakened patient who might otherwise stop breathing.

Science News Letter, April 2, 1960

PUBLIC HEALTH

Computer Spots Springs Pouring Salt Into Rivers

AN ELECTRONIC brain has helped U.S. Public Health Service engineers to pinpoint natural springs that pour up to 15 trainloads of salt per day into the Arkansas and Red Rivers.

The computer enabled the engineers to survey the 5,000-mile, eight-state river systems without time-consuming footwork and juggling of huge amounts of statistics.

Some of the springs, often hidden beneath the waters of the sprawling rivers and tributaries, were found to flow ten times saltier than the Atlantic Ocean.

Sen. Robert S. Kerr (D-Okla.), head of the Select Committee on National Water Resources of the U.S. Senate, hopes the Army Corps of Engineers will be able to build shut-off works, or divert spring flow

to areas where it can do no harm, at a reasonable cost.

It now appears probable, he said, that in the next two years "we can begin opening up large, new sources of excellent fresh water in the southwestern states, where the salt stream problem is most prevalent."

Spotting the salt sources was done by placing into the computer thousands of readings gathered from state and local sources and showing the salt content at many points along the streams. From these data the computer compiled a statistical "picture" showing the salt characteristics along the various reaches of the river systems.

Once suspicion was pinned down to a particular area, "conductivity meters" were used to lead engineers directly to the offending springs.

Surprisingly, it was found that springs and salt beds in less than a dozen areas in Texas, Oklahoma and Kansas were the major natural offenders. Sources of salt already found account for about two-thirds of the contamination and the remainder is expected to be relatively easy to locate. Most of the salt in the Red River comes from natural springs and salt beds and the rest from oil fields. The latter, however, causes a large part of the contamination in the Arkansas River.

Science News Letter, April 2, 1960

MEDICINE

Device Brings Patient's Temperature to Nurse

THE FLICK of a switch can now enable a hospital nurse to read a patient's temperature from her office.

The device is a clinical electronic thermometer that operates on transistors and a small battery. It was developed by Dr. D. C. Simpson of the Medical Physics Unit at Edinburgh University. It is already being used in a six-bed ward at the Edinburgh Royal Infirmary.

It consists of a meter, a switch and highly sensitive thermistors, or probes. The probe has a metallic oxide tip. The electrical resistance of this tip changes when heat is applied to it. It can be strapped to the patient and connected by wires to the central temperature reading point. There, resistance of the thermistor is measured and the temperature indicated on a dial.

The number of probes that may be connected to the meter is unlimited, so that by attaching one probe, or more if necessary, to each patient in a ward, the nurse in charge can obtain individual temperatures in both Fahrenheit and centigrade without stirring from her office.

The device may also be capable of locating diseased areas of the body, Dr. J. R. Greening, head of the University Unit, suggested. Diseased areas often impede the flow of blood which, in turn, lowers body temperatures, he explained.

The device can be produced in England at a cost of less than \$60 and will be available through the Wayne Kerr Corporation of Philadelphia.

Science News Letter, April 2, 1960

ROENTGENOLOGY

Isotope Technique Supplements X-Rays

MEDICAL radiograms of diagnostic quality comparable to conventional X-rays are being experimentally produced at the General Motors Research Laboratories, Warren, Mich., by a newly developed low-energy, short-lived radioisotope called Samarium-153. The new technique is expected to pave the way for use of X-rays where operation of an X-ray machine would be impossible—in the field, in emergency or disaster situations, and in remote jungle areas. Samarium-153 would supplement conventional X-ray equipment, not supplant it.

Science News Letter, April 2, 1960

OCEANOGRAPHY

Automatic Pool to Train Skin Diving Scientists

TO HELP TRAIN undersea explorers, a diving pool with automatic controls to imitate ocean conditions will be built at Scripps Institution of Oceanography, La Jolla, Calif. In this new aqualung training facility, Conrad Limbaugh, the head of Scripps diving program, explained, controls will automatically adjust the temperature and turbulence of the pool that will train divers for science.

The pool will be the University of California's only diver training facility. Students from various University of California campuses will use the pool to gain skin diving skill for research projects.

The \$160,000 diving facilities, including pool, towing tank and laboratory structures, were designed by Aerojet-General Corporation for the University of California.

Science News Letter, April 2, 1960

ELECTRONICS

Push-Buttons in Planes Will Signal in Seconds

A PUSH-BUTTON system for flashing messages from planes to ground stations is being built for the U. S. Air Force. With this system a plane can signal it is on fire or in distress in five seconds.

The system sends a simple code signal to a receiver on the ground. The receiver's magnetic memory converts the signal to a "canned" message. This is spelled out on a device that looks like the mileage dial on an automobile except that letters replace the numbers and form words. Messages also can be sent from the ground to the plane.

The Air Force expects the simple code system to permit communications at long ranges at which voice conversations might be indistinguishable.

Under an Air Force research and development contract, General Electric's Communication Products Department engineers at Lynchburg, Va., are scheduled to deliver models of the system by summer to the Wright Air Development Division's Communications and Navigation Laboratory at Dayton, Ohio.

Science News Letter, April 2, 1960

CHEMICAL ENGINEERING

The Tailored Molecule

The secret of finding "wonder" materials for future rockets, TV sets and automobiles rests in the new science of molecular engineering.

By ALLEN LONG

SOME DAY SCIENTISTS will be able to design with engineering precision the new materials needed to perform under special sets of conditions.

When they are able to do this, the hit-or-miss approach can be abandoned and one of the biggest and most costly bottlenecks to the advancement of scientific accomplishments will have been eliminated.

This has to come, for there are no holes in the periodic table of elements. This means that the "wonder" materials for future automobiles, wall TV sets and rocket ships must be made out of the basic substances we now have at hand.

The process of designing a new material to fit a special purpose might well be called "molecular engineering." It will include manipulating the molecular structures of known substances to build in the qualities needed.

Great strides in this direction already have been made. An end-product in one case is familiar to every person who owns a pocket-sized radio. It is the transistor, the tiny, rugged, chunk of germanium that has replaced vacuum tubes in many jobs, especially in hearing aids.

Transistors work because the germanium contains a tiny amount of impurity. The impurity may be as little as a few atoms of indium in a million atoms of germanium. Other impurities such as phosphorus, arsenic and antimony can be successfully used.

Pure germanium is a poor conductor of electricity. It has no free electrons. Each germanium atom has four electrons that seek to bond other atoms to it. In pure germanium, each atom successfully makes four electrical bonds with other atoms. No electrons are left over.

If germanium is to conduct electricity, it must have some free electrons. These are made available by adding tiny amounts of such "impurities" as indium, having three electrons for bonding, or phosphorus, arsenic and antimony, having five electrons for bonding.

Thus when a germanium atom combines with one of these "impurities," either the germanium has an electron left over, as in the case of a union with indium, or the impurity has an electron left over. These left-over electrons are free to move through the substance when a voltage is applied. Thus by adding an impurity to pure germanium, scientists changed a poor electrical conductor into a good conductor. The scientists, in effect, engineered the material to get a desired result.

Before scientists can go about an orderly engineering of materials having special properties, however, an enormous amount

of information must be amassed. The very first step is to learn the properties of pure materials. These properties are controlled by the crystal lattice structure, the way the atoms join to form larger units. Any imperfection in the lattice structure, or an increase in the kinds and amounts of impurities, can change the material's nature.

Then more information must be amassed as outside factors are brought to bear on the substance. These factors can be pressure, temperature, atomic radiation and the atmosphere surrounding the substance. A promising rocket material that withstands high temperatures might be found to lose this quality completely when subjected to the cosmic radiation found in space. Or perhaps the material might become even more heat resistant.

Once such information is available for a large number of chemical mixtures and compounds, scientists can take more of a slide-rule approach to the design of

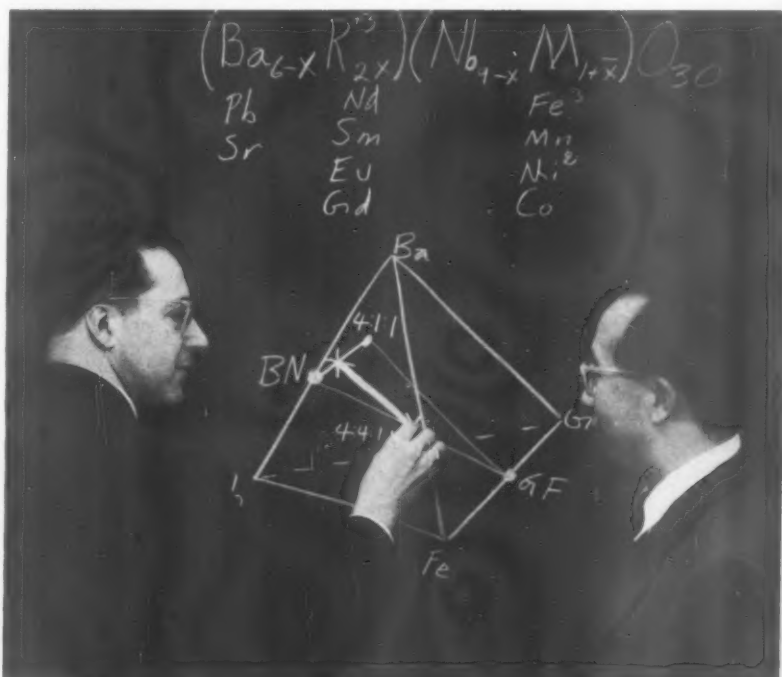
specific materials to meet specific needs.

One storehouse for this kind of data is at the National Bureau of Standards in Washington, D. C. Scientists there are constantly working out the factors that affect the properties and behavior of materials.

Even more-critical work at the Bureau involves the development of measuring techniques. To assure valid results, these measurement methods must be able to guarantee the scientist that he is actually measuring what he wants to measure.

To illustrate the measurement problem, Dr. Irl Schoonover, the Bureau's associate director for planning, said that when some property of a sample material is measured independently in several laboratories throughout the U. S., the results often vary widely. Before molecular engineering can get down to an exact science, all laboratories must be able to measure specific qualities and get consistent results.

Dr. Schoonover does not see the Bureau as a creative source of new, exotic materials. In advancing the art of molecular engineering, he foresees the Bureau contributing chiefly through development of "very fine methods to enable others to make the materials."



PORTRAIT OF A NEW MATERIAL—The pyramid-like blackboard drawing is a phase diagram, the portrait of a new ceramic that some day may be widely used in computers. The ceramic is a modified form of barium niobate. By substituting certain atoms for other atoms, scientists at the National Bureau of Standards have created a material that can "remember" not only by means of magnetism but also by electrical charges, combined qualities that until now have not been available in a single material.

These methods will include ways to prepare the material, to purify it, and to test its qualities through accurate measurements.

In the past, an enormous amount of work has been done in this field. Much of it, unfortunately, is of limited value.

One limitation is the temperature range at which materials were tested. Until recently, materials were studied at temperatures ranging up to about 2,700 degrees Fahrenheit. Suddenly rockets made material performance important at much higher temperatures.

Complicating the picture is the fact that composition of the materials studied was often not determined to a high accuracy.

Strange things sometimes happen under the many forces that can act upon a material, Dr. Alan D. Franklin, chief of the Bureau's mineral products division, said.

At frigid temperatures approaching absolute zero, for instance, liquid helium climbs the walls of its container. Some metals suddenly lose all electrical resistance and an electric current induced in them theoretically will circulate forever if the metal is kept that cold.

When water freezes, it becomes ice. When extreme pressures are exerted, it becomes a different type of ice. And then another type. All told, there are at least five different types of ice.

Under high pressure, new chemical compounds have been formed. Man has also been able to use pressure to produce in the laboratory things that so far have existed only in nature. For example, graphite, under pressure, can be made into diamond. Quartz, a special form of silicon dioxide (sand), can be made into Coesite.

Coesite represents an entirely new form of silicon dioxide. It is much denser than quartz. After being formed under high pressure, Coesite can be trapped in this state by releasing the pressure and cooling to room temperature.

Also at high pressures it has been found that some electrical insulators become semiconductors, and brittle substances such as bismuth and quartz become ductile. Tungsten carbide more than doubles its strength when under a pressure of 400,000 pounds per square inch. Liquid mercury freezes at 180,000 pounds per square inch.

It can be seen that a staggering panorama of material characteristics to be explored, and exploited, confronts the researcher in the molecular engineering field.

The qualities of materials are affected not only by external factors but also by their impurities, porosities, grain size, grain boundaries, lattice dislocations, strains, crystal imperfections, and ability of the surface to absorb liquids, solids and gases.

Each of these must be evaluated independently for each substance. This information is now being gathered and scientists are beginning to approach the point where "we can build in the qualities we want," Dr. Schoonover said.

Much work remains to be done before scientists will be able to engineer the materials they need. But the scope is so wide and the possible combinations of controlling factors is so astronomical that, once these are properly understood, it appears that a whole array of new and exciting materials some day can be created.

Science News Letter, April 2, 1960

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YOUR SKIN AND ITS CARE

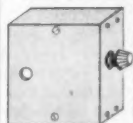
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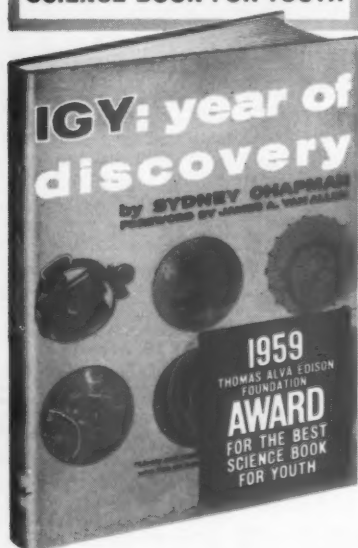
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ABOUT CAVES—Terry Shannon—*Melmont Pubs.*, 47 p., illus. by Charles Payzant, \$2.50. About cave formations and famous discoveries, for young children.

ABOUT OUR WEATHER—Gertrude Hevener Gibson—*Melmont Pubs.*, 31 p., illus. by Robert Totten, \$2.50. Simple explanations for beginners.

ACRYLIC RESINS—Milton B. Horn—*Reinhold*, 184 p., illus., \$4.50. Describes manufacture, fabrication and applications of acrylic cast products, molding compounds, emulsions and solution compounds.

ANATOMY OF SEED PLANTS—Katherine Esau—*Wiley*, 376 p., illus., \$6.95. Introductory one-semester course, includes glossary and bibliographies.

THE APPLE TREE COMMUNITY—George A. Smith—*Channel Press*, 96 p., photographs by author, \$5. Naturalist takes us through the seasons with the animals, birds, and insects that make the old tree their home.

ARTIFICIAL EARTH SATELLITES—Vols. 1 and 2—L. V. Kurnosova, Ed., transl. from Russian—*Plenum Press*, 227 p., illus., \$9.50. Account of scientific data obtained from the three Sputniks, as presented at Fifth Assembly of the Special IGY Committee in Moscow, 1958.

BRITANNICA BOOK OF THE YEAR 1960: A Record of the March of Events of 1959—John V. Dodge and Howard E. Kasch, Eds.—*Encyclopaedia Britannica*, 777 p., illus., \$12. Features special articles on Hawaii and on dating of the past.

CARTER'S MICROBIOLOGY AND PATHOLOGY—Alice Lorraine Smith—*Mosby*, 7th ed., 742 p., illus., \$7.50. Fully revised edition, with up-to-date information in rapidly expanding areas.

THE CHEMICAL HISTORY OF A CANDLE—Michael Faraday, William Crookes, Ed., introd. by Keith Gordon Irwin—*Viking*, 102 p., illus., paper, 95¢. The classic course of lectures Faraday delivered before a juvenile audience at the Royal Institution, December 1860.

CHILDREN IN A CHANGING WORLD—Interdepartmental Committee on Children and Youth—*White House Conference on Children and Youth*, 84 p., illus., paper, \$1.25. A book of charts providing basic data concerning the welfare of U.S. children.

CIVIL AIR REGULATIONS AND FLIGHT STANDARDS FOR PILOTS—Aeronautical Staff of Aero Publishers—*Aero Pubs.*, 22nd ed., 96 p., illus., paper, \$2.50. Contains new changes in FAA regulations.

CONFLUENT HYPERGEOMETRIC FUNCTIONS—L. J. Slater—*Cambridge Univ. Press*, 247 p., \$12.50. For mathematicians and theoretical physicists.

DATA FOR BIOCHEMICAL RESEARCH—R. M. C. Dawson and others—*Oxford Univ. Press*, 299 p., \$10.10. Handbook on compounds, reagents and laboratory techniques, arranged in tabular form.

FORMATION AND TRAPPING OF FREE RADICALS—Arnold M. Bass and H. P. Broida, Eds.—*Academic*, 522 p., \$16. Reference work on present status and techniques of free radical stabilization. Authors include physicists, physical chemists and chemical kineticists.

FROM ROCKS TO ROCKETS—Solveig Paulson Russell—*Rand McNally*, unpagged, illus. by Bette J. Davis, \$2.75. About man's tools, in simple language for young readers.

FUNDAMENTALS OF STRESS ANALYSIS—Albert Deyarmond and Albert Arslan—*Aero Pubs.*, 2nd ed., 256 p., \$5.75. Gives practical examples as they apply to wing, fuselage and missile shell analysis.

GENERAL CLIMATOLOGY—Howard J. Critchfield—*Prentice-Hall*, 464 p., illus., \$10.60. Introductory textbook on physical, regional and applied climatology.

GOOD DIGGING: The Story of Archaeology—Dorothy and Joseph Samachson—*Rand McNally*, 224 p., illus., \$3.50. For young people, shows how the archaeologist works, and why he must not only be a scientific detective but an art expert, linguist, engineer and photographer.

THE GRASSES: Earth's Green Wealth—Alma Chestnut Moore—*Macmillan*, 150 p., illus., \$5. Deals with the origins, cultivation, botanical characteristics and uses of the entire grass family, including the grains.

THE HEALTH OF THE PEOPLE WHO WORK—Albert Q. Maisel, Ed.—*National Health Council*, 268 p., \$4.50. Based upon reports to the 1959 National Health Forum of more than 200 experts in various areas of occupational health.

THE HOW AND WHY BOOK OF ELECTRICITY—Jerome J. Notkin and Sidney Gulkin, Paul E. Blackwood, Ed.—*Grosset*, 48 p., illus. by R. Patterson and C. Bernard, \$1. Shows children how to find answers experimentally to elementary questions about electricity.

THE HOW AND WHY BOOK OF WEATHER—George Bonsall, Paul E. Blackwood, Ed.—*Grosset*, 48 p., illus. by George Pay, \$1. Answers basic questions about the weather, emphasizing experiments.

THE IRIS—N. Leslie Cave—*St. Martin*, rev. ed., 240 p., illus., \$7.50. Handbook on the culture and care of iris, dwarf and unusual species, experiments with hybridization.

THE LOGIC OF MODERN PHYSICS—P. W. Bridgman—*Macmillan*, 228 p., paper, \$1.25. Examination of the purpose of physics and of the nature of its fundamental concepts, first published in 1927.

MAN, CULTURE, AND SOCIETY—Hairy L. Shapiro, Ed.—*Oxford Univ. Press*, 380 p., illus., paper, \$2.25. Reprint of basic anthropology for general reader, first published in 1956.

MONORAILS—Hermann S. D. Botzow, Jr.—*Simmons-Boardman*, 104 p., photographs, \$3.95. Objective view of the potential of monorail transportation in the United States. Presents technical data and 27-page bibliography.

THE NATION'S CHILDREN, 3 Vols: 1. The Family and Social Change. 2. Development and Education. 3. Problems and Prospects—Eli Ginzberg, Ed.—*Columbia Univ. Press*, 252 p., 242 p. and 242 p., \$13.50 per set, \$4.50 each. Collection of essays written for the Golden Anniversary White House Conference on Children and Youth.

A PUNJABI VILLAGE IN PAKISTAN—Zekiye Eglar—*Columbia Univ. Press*, 240 p., illus., \$6. Detailed study of the life of a Muslim village

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as modern changes penetrate the established relationships of its social life.

REPORT OF THE 44TH NATIONAL CONFERENCE ON WEIGHTS AND MEASURES 1959—National Bureau of Standards—GPO, 144 p., paper, illus., 65¢. Conference proceedings arranged for future reference.

SEARCH FOR THE PAST: An Introduction to Paleontology—James R. Beerbower—Prentice-Hall, 562 p., illus. by author, \$7.50. Textbook emphasizes evolutionary, developmental and paleoecologic viewpoints in presenting the study of the fossil record.

SEEDS ARE WONDERFUL—Willene K. Foster and Pearl Querec—Melmont Pubs., 32 p., illus. by Arnold Dobrin, \$2.50. The plant cycle, for beginning readers.

SIXTH TECHNICAL PROGRESS REPORT—W. L. Faith and N. A. Renzetti—Air Pollution, No. 30, 81 p., paper, \$3. Reviews recent studies, such as photooxidation of hydrocarbons, research in atmospheric chemistry, and motor vehicle exhaust standards.

SOCIAL PROBLEMS IN OUR TIME: A Sociological Analysis—S. Kirson Weinberg—Prentice-Hall, 600 p., \$6.75. Text on the social problems which characterize the highly urbanized society of contemporary United States.

SOVIET GEOGRAPHY: Review & Translation, Vol. I, No. 1-2—Theodore Shabad, Ed., Lawrence Ecker, Trans.—Am. Geographical Soc., 78 p., paper, \$1, monthly, \$6 a year. English reports of current Russian research in geography.

STUDIES IN HOUSING IN MINORITY GROUPS—Nathan Glazer and David McEntire, Eds.—Univ. of Calif. Press, 228 p., maps, \$6. Findings of seven local studies prepared for the Commission on Race and Housing.

SURGERY AS A HUMAN EXPERIENCE: The Psychodynamics of Surgical Practice—James L. Titchener and Maurice Levine—Oxford Univ. Press, 285 p., \$6. Explores the common ground of psychiatry and surgery, focusing on the psychological experience of the patient undergoing surgery.

TEXTILE ENGINEERING PROCESSES—A. H. Nissan, Ed.—Textile Book Pubs. (Interscience), 366 p., illus., \$9.25. Textbook giving engineer comprehensive survey of the materials, machinery and processes of the textile industry.

THEIR MAJESTIES THE MOB—John W. Caughey—Univ. of Chicago Press, 214 p., \$5. Analyzes the vigilante process past and present, illustrated with selections from publications.

THEORIES OF KNOWLEDGE—Reginald F. O'Neill, S.J.—Prentice-Hall, 242 p., \$4.25. Designed for courses in epistemology.

THEORY OF DIFFERENTIAL EQUATIONS, 3 Vols.—Andrew Russell Forsyth—Dover, new ed., 2,703 p., \$15. Unabridged reprint of original six volumes bound in three. Contains Exact Equations and Pfaff's Problem; Ordinary Equations not Linear (2); Ordinary Linear Equations and Partial Differential Equations.

THE THEORY OF HEAT RADIATION—Max Planck, transl. from German by Morton Masius—Dover, 224 p., paper, \$1.50. Unabridged reprint of translation of the second edition.

THEORY OF PROBABILITY—William Burnside—Dover, 106 p., paper, \$1. Reprint of 1928 edition.

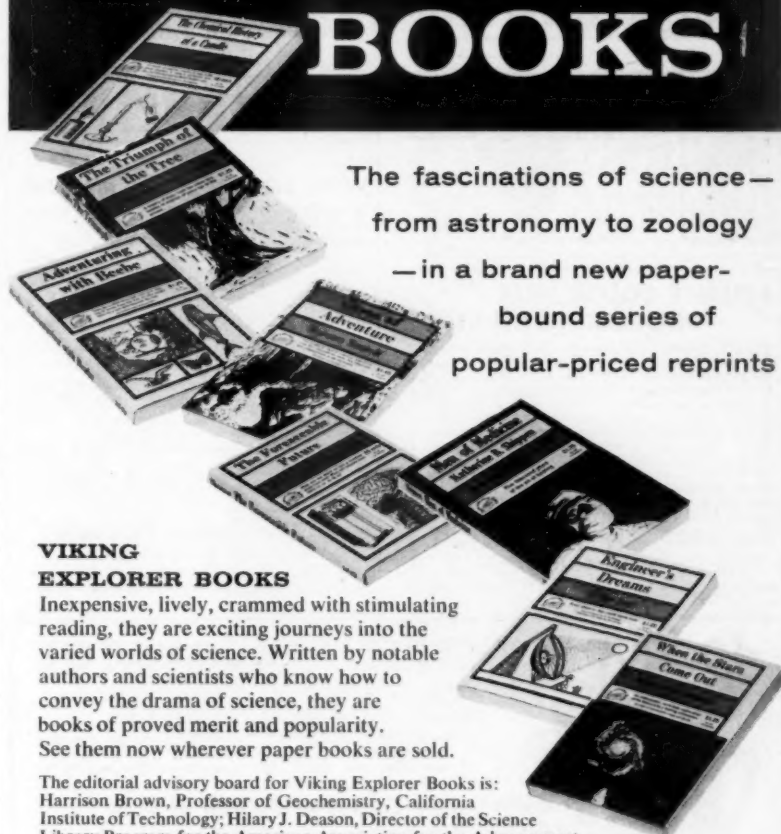
USING MATHEMATICS: Big Ideas and Basic Skills—Kenneth B. Henderson and Robert E. Pingry—McGraw, 2nd ed., 559 p., illus. by H. A. Fluchere, \$7.16. General mathematics, designed to hold young students' interest.

WAVES—F. J. M. Laver—Oxford Univ. Press, 85 p., illus., \$1.20. Concise chapters on echoes and reflections, interfering waves, water, seismic and electromagnetic waves.

X-RAY SPECTROCHEMICAL ANALYSIS—L. S. Birks—Interscience, 137 p., illus., \$5.75. Up-to-date material on excitation, dispersion, detection, quantitative analysis of techniques, and the electron probe microanalyzer.

Science News Letter, April 2, 1960

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MEDICINE—What are some of the symptoms of nephritis? p. 213.

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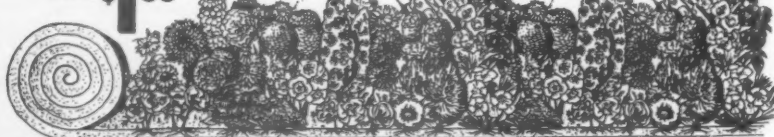
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Science Clubs of America

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PREPARATIONS are in full swing for the 11th National Science Fair-International, May 11-14 in Indianapolis, Ind. About 200 affiliated regional and area fairs are expected to be represented by some 370 finalists.

With the opening of the science fair season, fairs are being held in schools and auditoriums all over the nation and abroad.

The first set of entry materials for the national event already has been received in Washington headquarters at Science Service from David J. Wilson, Jr., of Athens, Ala., one of the two finalists from the North Alabama Regional Science Fair. David's project, proposing a method of survival on Mars, represents nearly 1,000 hours of work and research on the part of this "straight A" student.

Dr. Paul A. Siple, scientific director of polar research for the Department of the Army, Washington, D.C., is scheduled to be the principal speaker at the National Science Fair awards banquet, May 13. Known for his antarctic research since 1923 when, as an Eagle Scout, he accompanied Adm. Richard E. Byrd on his first expedition, Dr. Siple is also president of the Association of American Geographers.

Letters to Clubs Overseas

Nearly one hundred of the groups in Science Clubs of America located overseas will welcome correspondence with similar clubs in this country. Sponsors of U.S.A. clubs who wish to organize such exchange of information and letters with overseas clubs should write to the Executive Secretary of SCA, enclosing a self-addressed stamped envelope and asking for names of clubs in the part of the world they desire to contact.

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Science News Letter, April 2, 1960

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Science News Letter, April 2, 1960

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CLOSET DEHUMIDIFIER is said to end dampness, mold and musty odor in closets. About the size of a fluorescent light bulb, the electric device is simply plugged in and placed on the floor. Its triple action of warming, drying and circulating the air keeps the closet fresh by changing the air 150 times daily.

Science News Letter, April 2, 1960

TUB TRAY straddles the home bathtub and holds beauty aids, books, an ashtray or a cool drink for the bather. The plastic tray's supports are covered with vinyl to prevent marring of the tub.

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STUD SHELVES mount between open studs in garage or basement. The end of each wire shelf may be simply driven, like a nail, into the front of a stud to provide storage space for canned goods, paint, garden supplies, or hundreds of other items. The shelves are easily removed when rearranging or moving.

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Nature Ramblings



By HORACE LOFTIN

Spring Song

WINTRY WINDS were still hurtling icy blasts across the Deep South late in February and in early March this year. Bits of snow drifted into north Florida, to the dismay of chambers of commerce there. But though the ground lay frosted, bursts of summer-like song echoed through the air, the singing of mockingbirds.

Chilly weather could not fool these birds. They were fully aware that spring was just around the corner and that it was time to stake out a claim on their breeding territory. And singing is their delightful means of advertising their possession of a given spot of tree, air and land.

The bird that ventures near the claim of a singing mockingbird is a foolish one, indeed. He can expect a blitzkrieg attack of blows on the head and body for this thoughtlessness. The remaining robins that have not yet gone north seem to suffer the wrath of territorial mockingbirds more than



any others. Intent on their search for worms, perhaps they just fail to hear the mocker's warning. They pay a dear price for their inattention, though, in the forms of blows and ruffled feathers.

The "best" fights to watch are those between a righteously indignant mockingbird and another mocker who covets that landowner's property. Both are pugnacious to a ludicrous degree, and the scuffles are furious. As in the movies, the "good guy" usually wins, driving off the intruder.

Animals on their own territory seem to have a special confidence in battle, while interlopers tend to retreat quickly. Even tiny wrens drive pugnacious jays and larger birds from their own territories.

But the mocker will not drive every bird away. He must entice a mate into his territory, woo and win her. Thereafter, he has a staunch ally in defense of the homestead. If anything, his mate is more avid than he in keeping out other birds.

The mockingbird's song will reach a crescendo at the height of the nesting season. All through the southland summer night, the mocker's song is heard loud and clear, a lullaby to some people, a sleep-robbing nuisance to others. Then in mid-summer, after the young have left the nest, the territories are abandoned and the mockingbird's song is replaced by the lazy whirring of the cicadas in the summer heat. They sing again briefly in early autumn, but soon their voices are stilled until the coming of spring starts a new cycle of song.

Science News Letter, April 2, 1960